ASSIGNMENT 6

Textbook Assignment: "Shielded Metal-Arc Welding and Wearfacing" and "Gas Shielded-Arc Welding," pages 7-27 through 8-22.

Learnning Objective: Identify the principles of the arc welding hardfacing process.

6-1. What is the primary purpose of hardfacing or wearfacing parts of construction equipment?

1. To protect them from rust
2. To increase the alloy content of their base metal
3. To reduce wear
4. To protect them from corrosion

6-2. Which of the following factors have the most influence on the preheat temperature of a steel part that is to be hardfaced?

1. Size and ultimate use of the part
2. Austenitic and manganese contents of the steel
3. Degrees of magnetism and size of the steel
4. Carbon and alloy contents of the base metal

6-3. When the work location permits, you should use what welding position while wearfacing?

1. Vertical
2. Flat
3. Horizontal
4. Downhand

6-4. Hardfacing a cast-iron part is NOT recommended unless the part is to be subjected to abrasion because the cast iron tends to

1. crack
2. expand
3. shrink
4. chip

6-5. The materials used to build up a part before it can be hardfaced must be compatible with which of the following factors?

1. The type of equipment on which the part is to be used
2. The base metal and the hardfacing overlay
3. The welding procedure used to produce the part
4. The carbon content and heating temperature of the part

6-6. For which of the following reasons is checking essential when deposits are made with high-alloy electrodes?

1. The stresses may exceed tensile strength and cause spalling
2. The induced alloy strength tends to weaken the base metal
3. The tensile strength is increased in the base metal and cracking occurs
4. The tensile strength is decreased and swelling occurs

6-7. When hardfacing shovel teeth, you run the beads in what direction or pattern if the teeth are to be used primarily in rock?

1. Across each tooth
2. The length of each tooth
3. In a checkered pattern
4. In a waffle pattern

Learning Objective: Identify characteristics of and applications of the equipment used in carbon-arc cutting processes.

6-8. What maximum distance from the holder should the electrode extend when carbon-arc cutting?

1. 6 inches
2. 2 inches
3. 3 inches
4. 4 inches

6-9. What type of current is always used for the carbon-arc process?

1. Alternating current high frequency (ACHF)
2. Direct current reverse polarity (DCRP)
3. Direct current straight polarity (DCSP)
4. Alternating current straight polarity (ACSP)

6-10. When carbon-arc cutting with a compressed air attachment, the electrode holder operates within what air pressure range?

1. 40 to 60 psig
2. 50 to 70 psig
3. 60 to 100 psig
4. 100 to 200 psig

6-11. When gouging with an air carbon arc, what factor controls the depth and contour?

1. The amount of air pressure
2. The ampere rating of the electrode
3. The capacity of the power source
4. The electrode angle and travel speed

6-12. What is the recommended ampere setting range of 3/16-inch metal cutting-arc electrodes?

1. 125 to 300 amp DCSP
2. 250 to 375 amp DCRP
3. 300 to 450 amp DCSP
4. 450 to 550 amp ACSP

Learning Objective: Identify welding quality control processes and procedures.

6-13. Which of the following types of tests are used to test welds?

1. Diagnostic and Informative
2. Diagnostic and Destructive
3. Informative and Nondestructive
4. Destructive and Nondestructive

6-14. What type of inspection is the most effective means for detecting subsurface defects in welds?

1. Liquid Penetrant
2. Magnetic particle
3. Free-bend
4. Guided-bend

6-15. How many different groups of penetrants are available to perform liquid penetrant inspections?

1. One
2. Two
3. Three
4. Four

6-16. Before using a liquid penetrant, you must use which of the following cleaning materials?

1. Non-volatile solvent
2. Gas
3. Thinner
4. Standard cleaning solvent

6-17. For what period of time must you keep a surface wet with the penetrant before removing it from the piece?

1. 5 to 10 minutes
2. 10 to 15 minutes
3. 15 to 30 minutes
4. 20 to 40 minutes

6-18. After you have removed all of the penetrant and the surface has dried, you apply the developer. The developer must stay on the surface a minimum of how long?

1. 1 minute
2. 5 minutes
3. 7 minutes
4. 9 minutes

6-19. Which of the following tests is NOT used for destructive testing?

1. Free-bend
2. Nick-break
3. Impact
4. Radiographic

6-20. When preparing the welded specimen for a free-bend test, you must machine the welded reinforcement crown flush in the opposite direction from that in which the weld was deposited.

1. True
2. False

6-21. A crack develops in a specimen you are bending flat by applying the free-bend test. If the crack exceeds what length, you should stop the test because the weld has failed?

1. 1/32 inch
2. 1/16 inch
3. 1/8 inch
4. 1/4 inch

6-22. The guided-bend test is used to determine the quality of the weld metal at the face and root of a welded joint using a specially designed

1. jig
2. vise
3. bracket
4. clamp

6-23. While performing the guided bend test, to fulfill the requirements, how many degrees must you bend the piece?

1. 90°
2. 135°
3. 180°
4. 215°

6-24. What test is used for determining the internal quality of the weld metal by detecting slag inclusions, lack of fusion, and gas pockets?

1. Nick-break
2. Guided-bend
3. Liquid penetrant
4. Magnetic particle

6-25. While performing the nick-break test, you notice that there are five gas pockets in 1 square inch of weld. The size of each of the pockets is less than 1/16 inch at their widest point. This is an unsatisfactory weld.

1. True
2. False

Learning Objective: Identify the GMA-GTA welding processes and techniques.

6-26. In the GTA-GMA welding process, what type of current flow produces a wide, shallow weld?

1. DCSP
2. DCRP
3. ACHF
4. ACSP

6-27. As an exception to the general rule, DCRP is used with the GMA process to weld

1. aluminum and magnesium
2. copper and cast-iron
3. stainless steel and steel
4. copper and steel

6-28. What type of torch is used to weld light-gauge materials at a relatively low current setting?

1. A water-cooled GMA
2. A water-cooled GTA
3. A helium-cooled GMTA
4. A helium-cooled GTA

6-29. For butt welding, the electrode should extend past the gas cup for what distance?

1. A distance equal to its diameter
2. A distance equal to 1 1/2 its diameter
3. A distance equal to twice its diameter
4. A distance equal to 2 1/2 its diameter

6-30. Tungsten electrodes are color-coded at one end. What does the color brown indicate about the electrode?

1. It is a pure tungsten rod
2. It is a 1% thoriated tungsten rod
3. It is a 2% thoriated tungsten rod
4. It is alloyed with zirconium

6-31. What gases are most often used as GTA-GMA welding gases?

1. Xenon and radon
2. Neon and krypton
3. Argon, helium, or a mixture of the two
4. Carbon dioxide and bromine

6-32. The primary difference between the regulators used for oxyfuel welding and GTA/GMA welding is their working pressures.

1. True
2. False

6-33. When setting gas volume on a flowmeter, you should read the scale in which of the following ways ?

1. By aligning the bottom of the ball with the cfh required
2. By aligning the top of the ball with the cfh required
3. By aligning the center of the ball with the cfh required
4. By noting the vertical positions of the gas flow between the pressure gauge and the tank nozzle

6-34. Before starting an arc, you form a ball at the end of the electrode for ac welding. To accomplish this task, you set the current to DCRP and strike an arc for a moment on a piece of carbon or a piece of copper. After this action is completed, the ball should be at least two times the diameter of the electrode.

1. True
2. False

6-35. When butt welding, after striking an arc, you should hold the torch at what angle to (a) form the molten pool and (b) actually lay the weld bead?

1. (a) 70° (b) 75°
2. (a) 70° (b) 90°
3. (a) 90° (b) 75°
4. (a) 90° (b) 90°

6-36. When filler metal must be used, you should use what technique?

1. When the puddle becomes bright and fluid, you move the arc to the front of the puddle and quickly add filler metal into the center of the pool
2. When the puddle becomes bright and fluid, you move the arc to the rear of the puddle and quickly add filler metal to the front edge of the pool
3. Move the arc to and from the pool and melt the filler rod into the edge of the pool
4. Move the arc to and from the pool and melt the filler rod into the center of the pool

6-37. When GTA welding “out of position,” you must ensure you have metal with clean surfaces, good joint fit-up, and sufficient

1. liquid penetrate
2. joint dryer
3. air pressure
4. shielding gas

6-38. When GTA welding in the horizontal position, you should have how many degrees “push” angle?

1. 10°
2. 15°
3. 20°
4. 25°

6-39. When welding thin materials with the GTA welding process, you should weld from the top moving

1. downward
2. upward
3. to the left
4. in a zig-zag motion

6-40. When welding with the GTA process in the overhead position, you should lower the welding current by what percentage of what is normally used for flat welding?

1. 1 to 5 percent
2. 5 to 10 percent
3. 10 to 15 percent
4. 15 to 20 percent

6-41. For best results when welding aluminum with the GTA process you should use (a) what current and (b) what gas?

1. (a) Helium (b) DSCP
2. (a) Argon (b) ACHF
3. (a) Carbon dioxide (b) DCRP
4. (a) Argon (b) DCSP

6-42. Before welding gray cast iron with the GTA welding process, it must be preheated. What is the preheating temperature range?

1. 350° to 500°
2. 450° to 800°
3. 500° to 1250°
4. 600° to 1500°

6-43. The GMA welding process is normally chosen for use over the GTA welding process when thick metal has to be welded.

1. True
2. False

6-44. The advantages the GMA process provides over the GTA process are that it enables a welder to produce sound welds in all positions quickly, creates no slag, and produces

1. softer welds
2. a much lower flame
3. increased surface porosity
4. cleaner welds

6-45. GMA welding requires the use of what type of polarity?

1. DCRP
2. ACHF
3. DCSP
4. ACRP

6-46. In addition to the carrying of the electrode wire and the welding current, the functions of the welding gun include

1. reversing polarity
2. controlling wire feed
3. reducing air pressure
4. carrying the shielding gas to the arc area

6-47. When welding mild steel, you use pure argon as a shielding gas. This action produces shallow penetration undercutting, and

1. increased porosity
2. poor bead contour
3. deep cratering
4. clean welds

6-48. Carbon dioxide is used primarily for what type of metal?

1. Aluminum
2. Mild steel
3. Manganese
4. Copper

6-49. YOU use the same type of regulator and flowmeter for GMA welding as used for GTA welding.

1. True
2. False

6-50. What sound is produced when there is inadequate gas shielding?

1. Crackling
2. Popping
3. Sizzling
4. Bacon frying

6-51. YOU should store the unused portion of a wire spool of GMA wire in its original container in a hot locker located in an area that is

1. dry
2. humid
3. very cold
4. very hot

6-52. When you are GMA welding in the vertical or overhead positions, you use smaller diameter electrodes than those used in the flat position.

1. True
2. False

6-53. What is the proper amount of "wire stick-out" for micro wires?

1. Between 1/16 and 1/8 inch
2. Between 1/8 and 3/16 inch
3. Between 3/16 and 1/4 inch
4. Between 1/4 and 3/8 inch

6-54. Which of the following types of metal transfer is used to eliminate distortion, burn through, and spatter when welding thin-gauge metals?

1. Spray-arc welding
2. Globular transfer
3. Short-circuiting-arc transfer
4. Long-arc transfer

6-55. When starting an arc, you should hold the GMA welding torch at what angle to the work?

1. Between 5° and 20°
2. Between 25° and 30°
3. Between 30° and 45°
4. Between 45° and 90°

6-56. When striking an arc and the wire sticks to the piece, you should release the trigger and clip the wire with side cutters.

1. True
2. False

6-57. When welding pieces of unequal thickness, you should angle the torch in what direction?

1. Toward the thinner piece
2. Toward the thicker piece
3. Down the center line
4. Away from the center line

6-58. When you are GMA welding, the "travel angle" should be how many degrees?

1. Between 75° and 90°
2. Between 60° and 75°
3. Between 30° and 45°
4. Between 5° and 25°

6-59. The pulling or dragging technique of GMA welding is used for heavy gauge metals because it allows the welder to see the crater easily and produces great penetration.

1. True
2. False

6-60. What type of GMA welding defect is caused from a clogged nozzle, shielding gas set too low or high, and/or welding in a windy area?

1. Surface porosity
2. Crater porosity
3. Lack of penetration
4. Cold lap

6-61. Burn-through is corrected by increasing your welding speed and/or by reducing the wire-feed speed which, in turn, lowers the welding

1. amperage
2. voltage
3. resonance
4. shield

6-62. When GMA welding aluminum up to 1-inch thick, you use what type of shielding gas?

1. Helium
2. Carbon dioxide
3. Pure argon
4. A mixture of carbon dioxide and argon